

TUGBOAT *ARTHUR FOSS*
(Tugboat *Wallowa*)
(Tugboat *Theodore Foss*)
Lake Union Park
Seattle
King County
Washington

HAER WA-190
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PHOTOGRAPHS

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

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TUGBOAT *ARTHUR FOSS*

(Tugboat *Wallowa*)

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HAER No. WA-190

Location: Lake Union Park, Seattle, King County, Washington

Rig/Type of Craft: Tugboat

Trade: Towing

Principal Measurements: Length: 111.6'
Beam: 23.9'
Draft: 15'
Gross registered tonnage: 225
Net registered tonnage: 127
Maximum continuous shaft horsepower: 700
Service speed: 13 knots
[The listed dimensions are from James Delgado, "Arthur Foss, ex-Wallowa," National Register of Historic Places Registration Form, 1988, who obtained them from the *Thirty-Eighth Annual List of Merchant Vessels of the United States* (Washington, DC: Government Printing Office, 1906), p. 318.]

Propulsion: 4-cycle, 6-cylinder, direct-reversing diesel engine; originally equipped with a 122 horsepower, double-cylinder compound marine steam engine, single screw

Date of Construction: 1889

Original Owner: Oregon Railway & Navigation Company

Present Owner: Northwest Seaport, Maritime Heritage Center

Disposition: Museum vessel

Significance: The *Arthur Foss* is the last operational wooden-hull tugboat dating to the nineteenth century in the country. It is representative of the once ubiquitous tugboats operating on the Puget Sound. The *Arthur Foss* is also significant for its association with the Foss Launch and Tug Company, a regionally significant company in the Pacific Northwest.

Project Information: The Historic American Engineering Record (HAER) is part of Heritage Documentation Programs, a division of the National Park Service, U.S. Department of the Interior, Richard O'Connor, Manager. This project was undertaken as part of the HAER Maritime Program, Todd Croteau, Coordinator. Large-format photographs were produced by Todd Croteau in 2009.

Part I. Historical Information

A. Physical History:

1. Date of construction: 1889

2. Designer/Builder: David Stephenson, Portland, Oregon¹

3. Original plans and construction: The *Arthur Foss* has been little changed from its original construction. Maritime historian James Delgado describes the ship, based on the 1906 *Thirty-Eighth Annual List of Merchant Vessels of the United States*, as:

111.6 feet in length with a 23.9-foot beam, a 11.6-foot depth of hold, and a 15-foot draft. Wallowa [the ship's original name] was registered at 225 gross tonnage and 127 net tonnage. Built of Douglas fir, the tug's wooden hull was heavily built with 8- x 7-inch double-sawn frames, wooden knees, 4-inch thick outer hull and ceiling planking, treenail-fastened. The 15-inch thick keel was built with a 2-1/2-inch thick ironbark shoe, and the hull above the turn of the bilge is sheathed with 1-inch thick ironbark.²

The tug was originally equipped with a 122 horsepower (hp), double-cylinder compound marine steam engine that drove the single screw. The engine came from the tug *Donald*, operated by the Oregon Railway and Navigation Company. Union Iron Works manufactured this engine in 1887.³

4. Modifications: At the turn of the twentieth century, modern steam engines were installed on the tug. The deckhouse was rebuilt on the same lines using timber "cut for never-built World War I emergency fleet wooden steamers" after a fire destroyed it. The tow winch appears to have been installed ca. 1930.⁴

In April 1934, the tugboat underwent a major conversion from steam to diesel, and a new engine was consequently installed. A 1935 article in *Marine Review* described the ship's conversion, reporting it "gives the owner a handy and economical vessel for inside towing and harbor work while at the same time having the necessary power and cruising radius for ocean tows."⁵ Washington Iron Works of Seattle manufactured the diesel engine. Additional information can be found below in Section II, B, 1.

The hull and decks were restored in 2002 as part of a Save America's Treasures grant.

¹ David Stephenson is designated as both designer and builder in Michael Skalley, *Foss: Ninety Years of Towboating* (Seattle: Superior, 1981), p. 72.

² James Delgado, "Arthur Foss, ex-Wallowa," National Register of Historic Places Registration Form, 1988.

³ Delgado, "Arthur Foss, ex-Wallowa" Section 7, Page 2.

⁴ Quote and information from Delgado, "Arthur Foss, ex-Wallowa," Section 7, Page 2.

⁵ "Tug Converted from Steam to Diesel Drive," *Marine Review* 65, no. 2 (February 1935): p. 38.

6. Names: The tugboat was originally called the *Wallowa*. In 1929, the *Wallowa* was sold to the Foss Launch and Tug Company, who renamed it the *Arthur Foss* in 1934 after one of the company's operators. The name was again changed in December 1964 to *Theodore Foss* in honor of Andrew Foss' older brother. Northwest Seaport returned the name to *Arthur Foss* after its acquisition of the tugboat.⁶

B. Historical Context: The *Arthur Foss* operated as part of the Foss Launch and Tug Company for the majority of its history. The story of the company illustrates the vital role of tugboats in Washington's economy throughout the late nineteenth and early twentieth centuries. The *Arthur Foss* is representative of the numerous tugboats that once plied the West Coast. Andrew Foss, founder of Foss Launch and Tug Company, was born Andrew Olesen in Norway in 1855 and emigrated from Norway to the St. Paul area around 1880.⁷ He changed his name to Andrew Olesen Fossen, later shortened to Foss, to distinguish himself from the numerous Olesens already residing in the area. Andrew's wife Thea joined him in St. Paul, and they had three children: Arthur, Wedell, and Lillian. Minnesota's cold winters and a desire to live by the ocean prompted Andrew to travel west in 1888, and he eventually ended up in Tacoma, Washington. The family joined him there the following year. Andrew worked as a deckhand for the Tacoma Tugboat Company and in a shipyard. Thea, meanwhile, began renting out rowboats. She advertised their service as "Always Ready," which became the company's motto. During this time, Andrew and Thea had another son named Henry.

Andrew and his brothers, Iver and Peter, began rebuilding ships and selling them. They also began constructing rowboats and oars. Thea purchased a powered launch called the *Hope*, and Arthur and Wedell operated a delivery service to ships in the harbor. Andrew, Iver, and Peter further expanded their business by building launches to be used in the family's water-taxi and supply service, called the "Foss Launch Company." As business increased, the Foss operations moved to Salmon Bay in 1906. The Scandinavian crew kept busy buying and building boats for rental, while the Foss sons maintained their ship assist operation and Thea operated the company store. The shift from sailing to steamships meant less need for rescues, so the Foss family shifted its focus to the towing business, particularly log towing.

Andrew Foss designed a tug to meet the particular demands of log towing; "after many trials, the model ended up with a teardrop shaped underbody and a rounded stern on the above-water after-section. Andrew knew little about hydrodynamics, but his teardrop design ultimately became an industry standard....He designed a balanced rudder, plating ahead as well as in back of the rudder post, giving better control and tighter turning. He didn't patent any of his inventions. He said they were for the common good."⁸ With Iver's death in 1906 and Peter's three years later, Andrew, whose own health was failing, required the assistance of his sons to continue running the company. Henry left Stanford—where he had been attending business school—to help run the family business, which was reorganized as Foss Launch and Tug Company and incorporated by Andrew, Arthur, and Henry Foss along with Fred Berg. Wedell eventually gave up his law

⁶ See Skalley, pp. 72-75.

⁷ This history of the Foss Launch and Tug Company comes from Skalley.

⁸ Skalley, p. 16.

practice and started his own towing business in Seattle. He later purchased Fred Berg's stock, and the company became entirely owned by the Foss family.

Foss Launch and Tug Company continued to expand throughout the mid-part of the twentieth century, with operational bases established along the West Coast. The company's tugboats helped ships dock and undock and engaged in barging, salvaging, and rescuing, as well as log towing. During World War II, company ships moved supplies and equipment for the U.S. Army and Navy. The company operated in Puget Sound, British Columbia, Alaska, and California. In one of the Foss Company's more high profile operations, company ships delivered the concrete for the piers and placed the pier anchors for the Tacoma Narrows Bridge. In 1966, the company employed 800 people, seventy-five tugs, about seventy-five barges, and operated from the Gulf of Mexico to Alaska.

C. Operational History: The *Wallowa*, as the *Arthur Foss* was originally known, was designed and built by David Stephenson for the Oregon Railway & Navigation Company in 1889.⁹ It was initially used to rescue sailing vessels that had gotten stuck on the shallow bar at the mouth of the Columbia River and later for barge towing during the Alaskan Gold Rush. In 1900, Mike Earles of Puget Sound Sawmills obtained the tugboat for use in towing logs between Port Crescent and sawmills in Bellingham, Washington. Earles sold the tug to the Puget Sound Mill and Timber Company in 1904; Merrill & Ring Logging Company later obtained the tug for towing log rafts between the Straits and Port Angeles. In 1929, the Foss Launch and Tug Company purchased the tugboat.

The *Wallowa* had a starring role in the 1933 movie "Tugboat Annie." Based on a series of short stories about a tugboat operator by Norman Reilly Raine and published in the *Saturday Evening Post*, the movie helped popularize the tugboat.

In 1934, the tug, now called the *Arthur Foss*, was modified in Tacoma. The modifications included installing a 700-hp diesel engine and auxiliary machinery manufactured by Washington Iron Works. A company advertisement stated: "This 700-horsepower engine makes the ARTHUR FOSS the most powerful diesel tug on the West Coast. The selection of this powerful motor by one of the largest and most conservative tugboat companies on the Coast is another added instance of universal approval of Washington diesel power for difficult marine service."¹⁰

During World War II, the tug sailed to Hawaii, towing a closing gate for a graving dock at Pearl Harbor that it had picked up in Oakland. Once in Hawaii, the tug was chartered to tow barges of gravel for use in airport runway construction as well as other materials for building airbases and the French Frigate Shoals Landing Strip. The *Arthur Foss* was the last vessel to leave Wake Island before it was captured by the Japanese in 1942. In 1947, the ship was released from service and returned to the Foss Company. During transit from Hawaii in a floating drydock, it fell off the keel blocks and sustained hull damage. It was repaired in Tacoma and returned to service in 1948.

⁹ Operational history compiled from Skalley, pp. 72-75, and Delgado, "Arthur Foss, ex-Wallowa."

¹⁰ Quoted in Skalley, p. 73.

The ship continued to work towing logs to mills in the Strait of Juan de Fuca and Puget Sound for another twenty-two years. In December 1964, the tug was renamed the *Theodore Foss* in honor of Andrew's older brother. In 1968, the ship was laid up in Tacoma and donated two years later to Save Our Ships. It is now a part of the Northwest Seaport Maritime Heritage Center, who returned the ship's name to *Arthur Foss*. The tugboat was designated a National Historic Landmark in 1989.

Part II. Structural/Design Information

A. General Description:¹¹

1. Overall: The tugboat's overall form is little changed from its original construction. Measuring over 111' in overall length with a more than 24' beam, the ship is constructed of Douglas fir. Its form is typical of tugboats built before World War II. The deckhouse is a two-level structure, with the lower portion housing over and providing access to the engine room below deck. Forward of the engine room is the galley, with a diesel-fired range, built-in refrigerator, and countertop. Forward of the gallery are a wardroom and three crew cabins. Aft of the engine room on the port side is a head with a shower. The second level of the deckhouse is half the size of the first and contains three officers' cabins. The pilothouse contains the ship's original navigation equipment, including wooden and brass wheels, telegraph, and binnacle. The captain's cabin, aft of the pilothouse, contains a drop-down navigation table and writing desk and also houses modern radar and radio equipment.

Below decks, the hull is divided into the chain locker (far forward), foc's'le, forward tankage (with two large fuel tanks and with a narrow alley between), and engine room. The engine room contains the main engine, an auxiliary DC generator, a work bench, and two water tanks located port and starboard of the main engine. Aft of the main engine are three additional fuel tanks and access to the propeller shaft. Behind the fuel tanks, and inaccessible from the engine room, is a small lazarette. The tugboat has a single stack that contains exhaust systems for the main and auxiliary engines.

2. Decks: The forward deck contains an anchor winch and electric windlass, two metal bollards, and a hatch to the foc's'le. The aft deck contains the electric towing winch, AC generator, two bollards, steering quadrant, and steering cable housings. The tug has two masts; the foremast holds the ship's bell, horn, and lights, while the mainmast has the craneboom for a boat on the Texas deck. An outside helm station is located at the back of the Texas deck.

3. Crew accommodations: The three crew cabins are forward of the galley and each contain two built-in bunks, a closet, and a sink. The captain, mate, and engineer's cabins

¹¹ Description based on Delgado, "Arthur Foss, ex-Wallowa," Section 7, Page 2, and site visit by Todd Croteau, HAER Maritime Program Coordinator, 2009.

retain the original tongue-in-groove planks and fittings. Each contains one built-in bunk, a closet, and a sink. There is one full head with shower, sink, and commode on the lower aft port side of the deckhouse, and one small head with just a commode on the Texas deck.

4. Safety: There is a single lifeboat located on the Texas deck.

B. Mechanical Features:

1. Engine plant: The 1934 Washington Iron Works diesel engine has been restored and is operational. The 700 horsepower, 4-cycle, 6-cylinder, direct-reversing diesel engine is direct connected to the propeller shaft by a one-way clutch between the flywheel and thrust bearing. This is an important feature, because it “permits the towing winch to be driven from the main engine, thus giving ample power for the winch without a large auxiliary engine.” The main engine cylinders measure 18" in diameter and the stroke is 24". The maximum rated RPM is 180, which can drive the tug up to 13 knots. The engine measures 30'-1" in overall length, 6'-7" wide, and 12'-9 ½" high. It weighs 133,000 pounds. There is also a 7 hp, diesel-driven auxiliary generator, compressor, and scow pump. The main engine drives the towing winch. The steering engine is air-operated.¹²

2. Steering gear: The tugboat is equipped with a quadrant-cable steering system, and the cables “run aft on the deck, covered by wooden shoes, from the deckhouse to the counter.”¹³ The quadrant is located on the deck.

3. Other systems: Steel air and fuel tanks are located port and starboard in the engine room, along with 120-volt D.C. generators, switchboards, telegraphs, and gauges.¹⁴

Part III. Sources of Information

Delgado, James. “Arthur Foss, ex-Wallowa.” National Register of Historic Places Registration Form, 1988.

Skalley, Michael. *Foss: Ninety Years of Towboating*. Seattle: Superior, 1981.

“Tug Converted from Steam to Diesel Drive.” *Marine Review* 65, no. 2 (February 1935): p. 38.

¹² “Tug Converted from Steam to Diesel Drive,” p. 38.

¹³ Delgado, “Arthur Foss, ex-Wallowa,” Section 7, Page 2.

¹⁴ Delgado, “Arthur Foss, ex-Wallowa,” Section 7, Page 2. Delgado states that the tanks have an 80,000-gallon capacity, but that has not been verified at this time.